

## SMALL MAMMAL RECORDS FROM DOLPHIN ISLAND, THE GREAT SALT LAKE, AND OTHER LOCALITIES IN THE BONNEVILLE BASIN, UTAH

Kenneth L. Cramer<sup>1</sup>, A. Lee Foote<sup>1</sup>, and Joseph A. Chapman<sup>1</sup>

Collections made during 1985 and 1986 resulted in the following notes on reproduction, extensions of geographic ranges, and specimens of rare and uncommon small mammals from the Bonneville Basin in northwestern Utah. Collapsible Sherman live traps and Victor snap traps baited with a mixture of rolled oats, peanut butter, chopped raisins, and bacon fat were used for collections. Exact localities and dates of capture are reported under each species description.

**Vagrant shrew** (*Sorex vagrans vagrans*).—Three individuals were captured in June 1986 at Twin Springs in Tooele Co., a small spring dominated by saltgrass (*Distichlis spicata*) approximately 35 km south of Wendover, Utah (T9S, R16W). One specimen was found in an insect pitfall trap. Two additional specimens were caught 21 March 1986 in the Grassy Mountains (T3N, R11W, S26) in a shallow, narrow, dry ravine. The female contained six embryos 8 mm in length. These records extend the known range of this subspecies 35 km to the north (previous record, Durrant 1952, Ibapah, Utah) and substantiate the occurrence of this subspecies in this area of the Bonneville Basin.

**Sagebrush vole** (*Lagurus curtatus intermedius*).—Two females were recorded from the Grassy Mountains, near the area in which the vagrant shrews were captured. One captured 23 February 1986 was lactating and had four placental scars; the other was captured in September 1985. The latter specimen was prepared and deposited in the Department of Fisheries and Wildlife teaching collection at Utah State University. These records support the general distribution of this subspecies in northwestern Utah postulated by Durrant (1952) and establish the occurrence of the sagebrush vole in this western-central range

of the Bonneville Basin. In addition, we feel it noteworthy to mention a siting of a sagebrush vole on the extreme northern Newfoundland Mountains (T6N, R13W, S17), because of the isolated nature of this range, which is surrounded by barren salt flats. The vole, observed one afternoon in June 1985, was clearly identified by its short tail and very light pelage.

**Little pocket mouse** (*Perognathus longimembris gulosus*).—Thirteen specimens were collected in May 1986 from the western edge of Floating Island, Tooele Co., Utah (T2N, R16W, S22), approximately 50 km northeast of Wendover, Utah, near the end of Silver Island Mountains. The site had fine sandy soil, and the dominant shrub was desert milkwort, *Polygala intermontana*. Three specimens were also collected from the north end of the Newfoundland Mountains (also reported there by H. Egoscue, personal communication). These records confirm Durrant's (1952) hypothesized distribution for this subspecies in the western deserts of Utah.

### SMALL MAMMALS OF DOLPHIN ISLAND

We trapped for two nights in August 1986 when the Great Salt Lake was at a peak level of 4,212 feet above sea level. The high lake levels reduced this island to an area of <25 ha (area calculated based on the 4,210-foot contour line). A drop in lake level to 4,200 feet expands the island area to 210 ha, although much of this area is unvegetated mud flats. In 750 trap nights on the island (T9N, R10W) only *Dipodomys ordii* and *P. longimembris* were captured. This contrasts markedly with Goldman's (1939) and Marshall's (1940) censuses of the island 50 years ago. Goldman spent two nights on the island and found a

<sup>1</sup>Department of Fisheries and Wildlife, Utah State University, Logan, Utah 84322-5210.

much more diverse small mammal fauna in only 37 trap nights. At that time the Great Salt Lake was at a historic low, and the island was connected to the mainland by a low sandbar. Goldman reported capturing deer mice (*Peromyscus maniculatus*), ground squirrels (*Spermophilus townsendi*), and both Ord's (*D. ordii*) and chisel-toothed (*D. microps*) kangaroo rats. Also, he recorded evidence of desert woodrat (*Neotoma lepida*), coyotes (*Canis latrans*), and a carcass of a porcupine (*Erethizon dorsatum*). Goldman (1939) named a new subspecies of chisel-toothed kangaroo rat (*D. m. russeolus*) and Ord's kangaroo rat (*D. o. cineraceus*), based on specimens he captured on the island.

We saw sign of runways of *S. townsendi* through dense stands of cheatgrass, although we saw no aboveground activity in August when we visited the island. In addition, we saw droppings and weathered nests of *Neotoma*, but none of them were recent, suggesting that there may be no woodrats left on this island. While no live lagomorphs were observed on the island, two weathered, disarticulated skeletons of jackrabbits (*Lepus* sp.) were also found, but these could have been carried there by raptors. The island almost certainly has no *Peromyscus* remaining. In other west desert areas we would normally catch a minimum of 10–15 deer mice for 750 trap nights of effort even in very poor habitat such as the cheatgrass (*Bromus tectorum*) monoculture dominating the island. We caught no specimens of *D. microps* and believe that the subspecies named for its occurrence on the island, *D. m. russeolus*, is extinct.

**Ord's kangaroo rat** (*Dipodomys ordii marshalli*).—We captured 11 individuals of this subspecies. Five specimens were deposited in the National Museum of Natural History and another five reside in the University of Utah Museum of Natural History.

The specimens of Ord's kangaroo rat do not appear to fit within the range of variation for *D. o. cineraceus*, the subspecies first described by Goldman (1939) as endemic to Dolphin Island. Our specimens are much darker than *cineraceus*, particularly the tails. In addition, all of our specimens have black facial markings like the mainland subspecies, *D. o. marshalli*. Only one specimen from the original series of *cineraceus* has these markings

(personal communication, Don Wilson, U.S. Biological Survey). However, our specimens are not identical to *marshalli*; they are slightly paler and the tails are darker than *marshalli*. The skulls of all specimens are very similar. These comparisons of our specimens with the original series (collected by Goldman) were confirmed by comparisons to specimens of *D. o. marshalli* at the University of Utah Museum of Natural History. Thus, we feel that our specimens of *D. ordii* collected on Dolphin Island are more closely related to the subspecies *D. o. marshalli* than to the original subspecies *D. o. cineraceus* described by Goldman (1939). Durrant (1952) earlier questioned the validity of subspecific status for *cineraceus*, noting frequent connection of Dolphin Island with the mainland and a lack of nearby mainland specimens.

**Little pocket mouse** (*Perognathus longimembris gulosus*).—Six specimens of the little pocket mouse were collected on Dolphin Island. This species has not been recorded previously from any island in the Great Salt Lake (Goldman 1939, Marshall 1940, Bowers 1982). Few records are available for this species in the Bonneville Basin (Durrant 1952, Shippee and Egoe 1968), the nearest from Kelton, Utah, on the north shore of the lake. Trapping on the nearby mainland at higher elevations (5,500 feet) in the Hogup Mountains failed to produce any individuals of this species. This may have been due to the absence of habitats usually preferred by this species. The *P. longimembris* specimens collected on Dolphin Island are much darker overall than *gulosus* (although still within the range of variation of this subspecies) but appear identical in skull morphology. Specimens examined from Dolphin Island are deposited in the National Museum of Natural History (3) and the University of Utah Museum of Natural History (3).

The complete isolation of the island from the mainland for several years probably explains these faunal changes. High lake levels have inundated formerly choice dune habitats occupied by the heteromyids that still persist on the island. It is likely that the island fauna has changed repeatedly over the years as a result of lake level fluctuations that alternately isolated it from and connected it with the mainland. In the 1900s alone, the island has been isolated from and reconnected to the

mainland on at least three separate occasions (Gwynn 1980). This could account for the apparent reinvasion of the island by *D. o. marshalli* and possible swamping of variation found in the subspecies *cineraceus*. Frequent and periodic invasions and subsequent isolation make Dolphin Island a very dynamic system whose mammalian fauna could change dramatically as often as lake levels fluctuate with varying precipitation patterns. Major changes include the extinction of a unique subspecies (*D. m. russeolus*) and the potential creation of a new subspecies of little pocket mouse.

Whereas Marshall (1940) recorded seven species of mammals on Dolphin Island when it was connected by a narrow sandbar to the mainland, now apparently only two small mammal species, *Dipodomys ordii* and *Perognathus longimembris*, survive, with possibly a third species, *Spermophilus townsendii*, surviving as well.

#### ACKNOWLEDGMENTS

This study was funded in part by U.S. Air Force Department of Defense Contract No. F42650-84-C3559 through the Utah State University Foundation. The Department of Fisheries and Wildlife and the Ecology Cen-

ter of Utah State University provided vehicles and other logistical and technical support. The Utah Department of Wildlife Resources granted the necessary collecting permits. Additional thanks are due to Don Wilson of the U.S. Biological Survey for his comparison of our specimens of *D. ordii* with the topotypes from Dolphin Island.

#### LITERATURE CITED

- BOWERS, M. A. 1982. Insular biogeography of mammals in the Great Salt Lake. *Great Basin Naturalist* 42: 589-596.
- DURRANT, S. D. 1952. Mammals of Utah: taxonomy and distribution. University of Kansas Publications, Lawrence.
- GOLDMAN, E. A. 1939. Nine new mammals from islands in the Great Salt Lake, Utah. *Journal of Mammalogy* 20: 351-357.
- GWYNN, J. W. 1980. Great Salt Lake, a scientific, historical and economic overview. Utah Geological and Mineral Survey, Utah Department of Natural Resources, Bulletin 116.
- MARSHALL, W. H. 1940. A survey of the mammals of the islands in Great Salt Lake, Utah. *Journal of Mammalogy* 21: 144-159.
- SHIPPEE, E. A., AND H. J. EGOSCUE. 1958. Additional mammal records from the Bonneville Basin, Utah. *Journal of Mammalogy* 39: 275-277.

*Received 20 February 1990*

*Revised 24 May 1990*

*Accepted 24 May 1990*